

We claim:

1 1. A method for protecting a material from ant infestation, comprising treating the material with
2 an effective amount of a compound selected from the group consisting of nootkatone, α -cedrene,
3 zizanol, and bicyclovetivenol, wherein the treated material repels or kills ants substantially more
4 than does an otherwise identical material that has not been treated with the compound.

1 2. A method as in Claim 1, wherein the ants are fire ants.

3. A method as in Claim 1, wherein the treated material repels ants.

4. A method as in Claim 1, wherein the treated material kills ants.

1 5. A method as in Claim 1, wherein the material is selected from the group consisting of soil,
2 synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1 6. A method as in Claim 1, wherein the compound is nootkatone.

- 1 7. A method as in Claim 1, wherein the compound is α -cedrene.
- 1 8. A method as in Claim 1, wherein the compound is zizanol.
- 1 9. A method as in Claim 1, wherein the compound is bicyclovetivenol.
10. A method as in Claim 1, additionally comprising treating the material with one or more additional, different compounds selected from the group consisting of nootkatone, α -cedrene, zizanol, and bicyclovetivenol.
11. A protective barrier against ant infestation, said barrier comprising an effective amount of a compound selected from the group consisting of nootkatone, α -cedrene, zizanol, and bicyclovetivenol, and a substrate, wherein said barrier repels or kills ants substantially more than does an otherwise identical barrier that has not been treated with said compound.
- 1 12. A composition as in Claim 11, wherein the ants are fire ants.

1 13. A composition as in Claim 11, wherein said substrate comprises a mulch.

1 14. A composition as in Claim 13, wherein said mulch comprises dried vetiver grass.

1 15. A composition as in Claim 13, wherein said mulch comprises cellulose-containing material.

1 16. A composition as in Claim 11, wherein said substrate comprises soil.

1 17. A composition as in Claim 11, wherein said substrate comprises diatomaceous earth.

1 18. A composition as in Claim 11, wherein said compound is nootkatone.

1 **19.** A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is
2 between about 10 $\mu\text{g/g}$ and about 1000 $\mu\text{g/g}$.

1 **20.** A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is
2 between about 10 $\mu\text{g/g}$ and about 200 $\mu\text{g/g}$.

4 **21.** A composition as in Claim 11, wherein said compound is zizanol.

4 **22.** A composition as in Claim 11, wherein said compound is bicyclovetivenol.

4 **23.** A composition as in Claim 11, wherein said compound is α -cedrene.

1 **24.** A composition as in Claim 11, additionally comprising treating said substrate with a one or
2 more additional, different compounds selected from the group consisting of nootkatone, α -cedrene,
3 zizanol and bicyclovetivenol.

1 **25.** A method for protecting a material from tick infestation, comprising treating the material
2 with an effective amount of a compound selected from the group consisting of nootkatone, α -
3 cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels or kills ticks substantially
4 more than does an otherwise identical material that has not been treated with the compound.

1 **26.** A method as in Claim 25, wherein the treated material repels ticks.

27. A method as in Claim 25, wherein the treated material kills ticks.

28. A method as in Claim 25, wherein the material is selected from a group consisting of soil,
synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1 **29.** A method as in Claim 25, wherein the compound is nootkatone.

1 **30.** A method as in Claim 25, wherein the compound is α -cedrene.

1 **31.** A method as in Claim 25, wherein the compound is zizanol.

1 **32.** A method as in Claim 25, wherein the compound is bicyclovetivenol.

1 **33.** A method as in Claim 25, additionally comprising treating the material with one or more
2 additional, different compounds selected from the group consisting of nootkatone, α -cedrene,
3 zizanol, and bicyclovetivenol.

1 **34.** A protective barrier against tick infestation, said barrier comprising an effective amount of
2 a compound selected from the group consisting of nootkatone, α -cedrene, zizanol, and
3 bicyclovetivenol, and a substrate, wherein said barrier repels or kills ticks substantially more than
4 does an otherwise identical barrier that has not been treated with said compound.

1 **35.** A composition as in Claim 34, wherein said substrate comprises a mulch.

1 **36.** A composition as in Claim 35, wherein said mulch comprises dried vetiver grass.

1 **37.** A composition as in Claim 35, wherein said mulch comprises cellulose-containing material.

1 **38.** A composition as in Claim 34, wherein said substrate comprises soil.

1 **39.** A composition as in Claim 34, wherein said substrate comprises diatomaceous earth.

1 **40.** A composition as in Claim 34, wherein said compound is nootkatone.

1 **41.** A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is
2 between about 10 $\mu\text{g/g}$ and about 1000 $\mu\text{g/g}$.

1 42. A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is
2 between about 10 $\mu\text{g/g}$ and about 200 $\mu\text{g/g}$.

1 43. A composition as in Claim 34, wherein said compound is zizanol.

1 44. A composition as in Claim 34, wherein said compound is bicyclovetivenol.

1 45. A composition as in Claim 34, wherein said compound is α -cedrene.

1 46. A composition as in Claim 34, additionally comprising treating the substrate material with
2 a one or more additional, different compounds selected from the group consisting of nootkatone, α -
3 cedrene, zizanol and bicyclovetivenol.

1 47. A topical composition for application to the skin or fur of a mammal for protection against
2 ticks, said composition comprising an effective amount of a compound selected from the group
3 consisting of nootkatone, α -cedrene, zizanol, and bicyclovetivenol, and a pharmaceutically accepted
4 carrier, wherein said composition when applied topically repels or kills ticks substantially more than
5 does an otherwise identical composition that lacks the compound.

- 1 **48.** A composition as in Claim 47, wherein said compound is nootkatone.
- 1 **49.** A composition as in Claim 48, wherein the concentration of nootkatone in said composition
2 is between about 10 $\mu\text{g/g}$ and about 1000 $\mu\text{g/g}$.
50. A composition as in Claim 48, wherein the concentration of nootkatone in said composition
is between about 10 $\mu\text{g/g}$ and about 200 $\mu\text{g/g}$.
51. A composition as in Claim 47, wherein said compound is zizanol.
- 1 **52.** A composition as in Claim 47, wherein said compound is bicyclovetivenol.
- 1 **53.** A composition as in Claim 47, wherein said compound is α -cedrene.

1 **54.** A composition as in Claim 47, additionally comprising a composition with a one or more
2 additional, different compounds selected from the group consisting of nootkatone, α -cedrene, zizanol
3 and bicyclovetivenol.

1 **55.** A method for protecting a material from cockroach infestation, comprising treating the
2 material with an effective amount of a compound selected from the group consisting of nootkatone,
3 α -cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels cockraches substantially
4 more than does an otherwise identical material that has not been treated with the compound.

1 **56.** A method as in Claim 55, wherein the material is selected from the group consisting of soil,
2 synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1 **57.** A method as in Claim 55, wherein the compound is nootkatone.

1 **58.** A method as in Claim 55, wherein the compound is α -cedrene.

1 **59.** A method as in Claim 55, wherein the compound is zizanol.

- 1 **60.** A method as in Claim 55, wherein the compound is bicyclovetivenol.
- 1 **61.** A method as in Claim 55, additionally comprising treating the material with one or more
2 additional, different compounds selected from the group consisting of nootkatone, α -cedrene,
3 zizanol, and bicyclovetivenol.
- 4 **62.** A protective barrier against cockroach infestation, said barrier comprising an effective
5 amount of a compound selected from the group consisting of nootkatone, α -cedrene, zizanol, and
6 bicyclovetivenol, and a substrate, wherein said barrier repels cockroaches substantially more than
7 does an otherwise identical barrier that has not been treated with said compound.
- 8 **63.** A composition as in Claim 62, wherein said substrate comprises a mulch.
- 1 **64.** A composition as in Claim 63, wherein said mulch comprises dried vetiver grass.
- 1 **65.** A composition as in Claim 63, wherein said mulch comprises cellulose-containing material.

1 66. A composition as in Claim 62, wherein said substrate comprises soil.

1 67. A composition as in Claim 62, wherein said substrate comprises diatomaceous earth.

1 68. A composition as in Claim 62, wherein said compound is nootkatone.

69. A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is between about 10 $\mu\text{g/g}$ and about 1000 $\mu\text{g/g}$.

1 70. A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is
2 between about 10 $\mu\text{g/g}$ and about 200 $\mu\text{g/g}$.

1 71. A composition as in Claim 62, wherein said compound is zizanol.

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1 **72.** A composition as in Claim 62, wherein said compound is bicyclovetivenol.

1 **73.** A composition as in Claim 62, wherein said compound is α -cedrene.

1 **74.** A composition as in Claim 62, additionally comprising treating the substrate material with
a one or more additional, different compounds selected from the group consisting of nootkatone, α -
cedrene, zizanol and bicyclovetivenol.